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मानक

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IS 3170-1 (2006): Internal Combustion Engines - Fuel Injection Nozzles, Part 1: Injection Nozzles - Size 'S' [TED 2: Automotive Primemovers]



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“Knowledge is such a treasure which cannot be stolen”

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भारतीय मानक

अंतर्दाही इंजन — ईंधन अंतःक्षेपण नोज़ल

भाग 1 अंतःक्षेपण नोज़ल — साइज 'एस'

(दूसरा पुनरीक्षण)

Indian Standard

INTERNAL COMBUSTION ENGINES — FUEL
INJECTION NOZZLES

PART 1 INJECTION NOZZLES — SIZE 'S'

(*Second Revision*)

ICS 43.060.40

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BUREAU OF INDIAN STANDARDS

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NATONAL FOREWORD

This Indian Standard (Part 1) (Second Revision) which is identical with ISO 2697 : 1999 Diesel engines — Fuel nozzles — Size “S” issued by the International Organization for Standardization (ISO) was adopted by the Bureau of Indian Standards on the recommendation of the Automotive Primemovers Transmission and Steering Systems and Internal Combustion Engines Sectional Committee and approval of the Transport Engineering Division Council.

In view of the emerging technological developments in the diesel engine manufacturing industry in the country and also with the growing concern over the acceptability of the engines and their components in the international market, it was decided to upgrade the contents of the standard that have a bearing on the quality of the engines to the international level. The adoption of International Standards by dual numbering system was considered as appropriate for the purpose and accordingly the corresponding International Standards have been brought under the dual numbering system.

This standard was first published in 1965 and revised in 1997. The second revision of the standard has been undertaken due to revision of base standard and to bring it in line with dimensional requirements for certain category of injection nozzles used in diesel engines and their interchangeability in the corresponding nozzle holders followed internationally. During the revision, the committee had examined and considered the other International Standards relevant to the subject and agreed to bring them as parts of the standard to make them more useful for the industry.

The following technical changes have been incorporated:

- a) Scope has been modified and restricted to size ‘S’ fuel nozzles used in diesel engines.
- b) Title has been modified:
 - 1) Fuel injection nozzles to fuel nozzles.
 - 2) Internal combustion engines to diesel engines.
- c) Clause on normative references is elaborated.
- d) Clause on field of application has been shifted under scope.

The text of the ISO Standard has been approved as suitable for publication as an Indian Standard without deviations. Certain conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

- a) Wherever the words ‘International Standard’ appear referring to this standard, they should be read as ‘Indian Standard’.
- b) Comma (,) has been used as a decimal marker while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 ‘Rules for rounding off numerical values (*revised*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

INTERNAL COMBUSTION ENGINES — FUEL INJECTION NOZZLES

PART 1 INJECTION NOZZLES — SIZE 'S'

(*Second Revision*)

1 Scope

This International Standard specifies the essential dimensional requirements for size "S" fuel nozzles used in diesel engines.

These requirements allow the assembly and interchangeability of the nozzles in the corresponding nozzle holders.

This International Standard is applicable to size "S" nozzles, which comprise hole type, long-stem nozzles (types A1 and A2) and pintle nozzles (type B).

NOTE Type A1 and type B nozzles are the preferred types. The non-preferred hole type, short-stem nozzle, type C, is shown in annex A.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

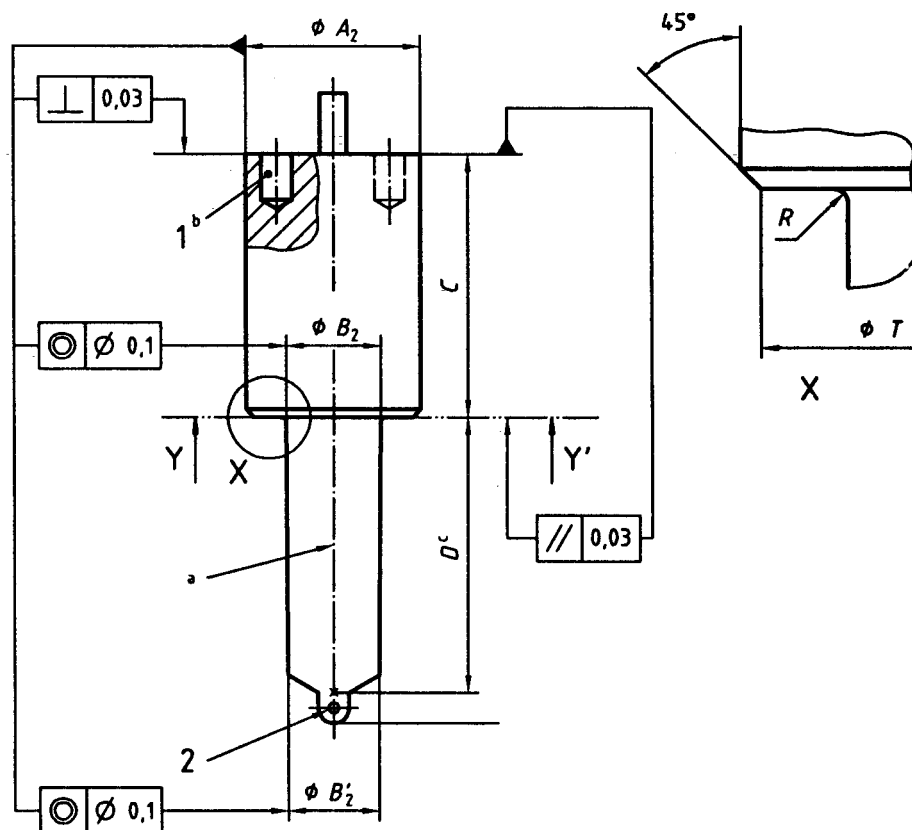
ISO 2699, *Diesel engines — Flange-mounted fuel injectors, size "S" — Types 2, 3, 4, 5 and 6.*

ISO 7026, *Diesel engines — Screw-in injection nozzle holders, types 20, 21, 21.1 and 27 for pintle nozzle size "S", type "B".*

ISO 7030, *Road vehicles — Screw-mounted injection nozzle holders, types 12, 13, 14, 15, 16, 17, 18 and 19.*

3 Dimensions and tolerances

See Figures 1 and 2 and Table 1.

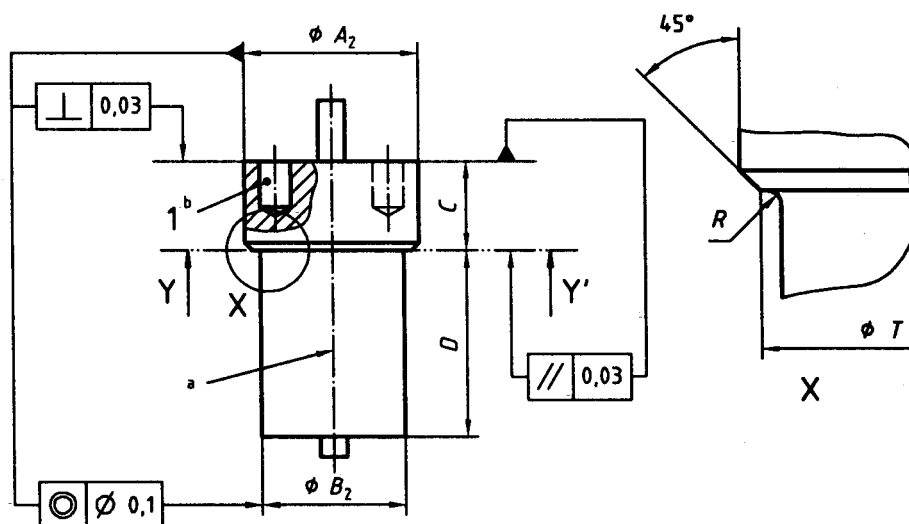


Key

- 1 Fuel feed groove
- 2 Injection holes

- a The reference axis for the nozzle passes through the centre of the circle of diameter A_2 .
- b A fuel feed groove is necessary only on nozzles without dowel holes and on nozzles having multiple fuel feed holes.
- c This dimension determines the distance between the reference plane YY' and the point of intersection of the axes of the injection holes with the nozzle axis.

Figure 1 — Hole type, long-stem nozzle — Type A1 and Type A2



Key

1 Fuel feed groove

- a The reference axis for the nozzle passes through the centre of the circle of diameter A_2 .
- b A fuel feed groove is necessary only on nozzles without dowel holes and on nozzles having multiple fuel feed holes.

Figure 2 — Pintle nozzle — Type B

Table 1

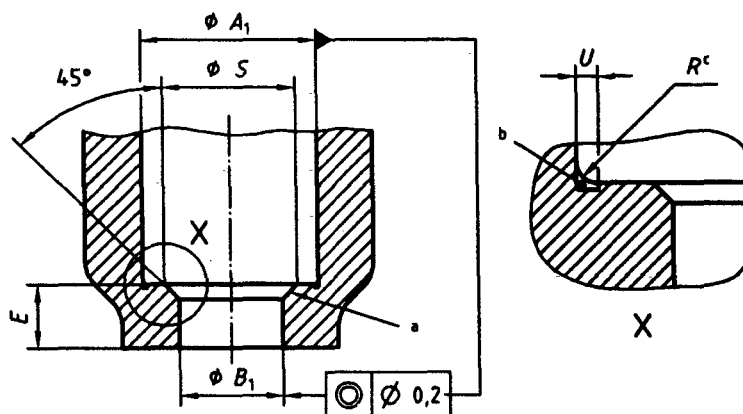
Dimensions in millimetres

Nozzle type	Dimension						
	A_2	B_2	B_2'	C	D	T	R
A1 ^a	17 h11	9,2 max. ^b	8,9 min.	25 ⁰ _{-0,6}	26,5 ^{+0,2} _{-0,3}	15,5 ^{+0,5} ₀	0,6 max.
A2					38,5 ^{+0,2} _{-0,3}		
B		14 c11	—	8 ⁰ _{-0,4}	19 ± 0,2	16,3 ^{+0,2} ₀	0,25 max.
^a Preferred type							
^b $B_2 \geq B_2'$							

4 Assembly of nozzles in nozzle holders

4.1 Dimensions and tolerances of the nozzle cap nut

See Figure 3 and Table 2.



- a Chamfer or similar form
- b Undercut or radius within dimension U
- c $R = U$

Figure 3 — Nozzle cap nut

Table 2

Dimensions in millimetres

Nozzle type	Dimension				
	A_1	B_1	E	S	U
A1 and A2	17 D13	$10^{+0,16}_{-0,05}$	$6,2^{0}_{-0,2}$	$11,5^{+0,3}_{0}$	0,4 max.
B		$14,3^{+0,2}_{0}$		$15,0 \pm 0,1$	0,2 max.

4.2 Dimensions and tolerances of the assembly

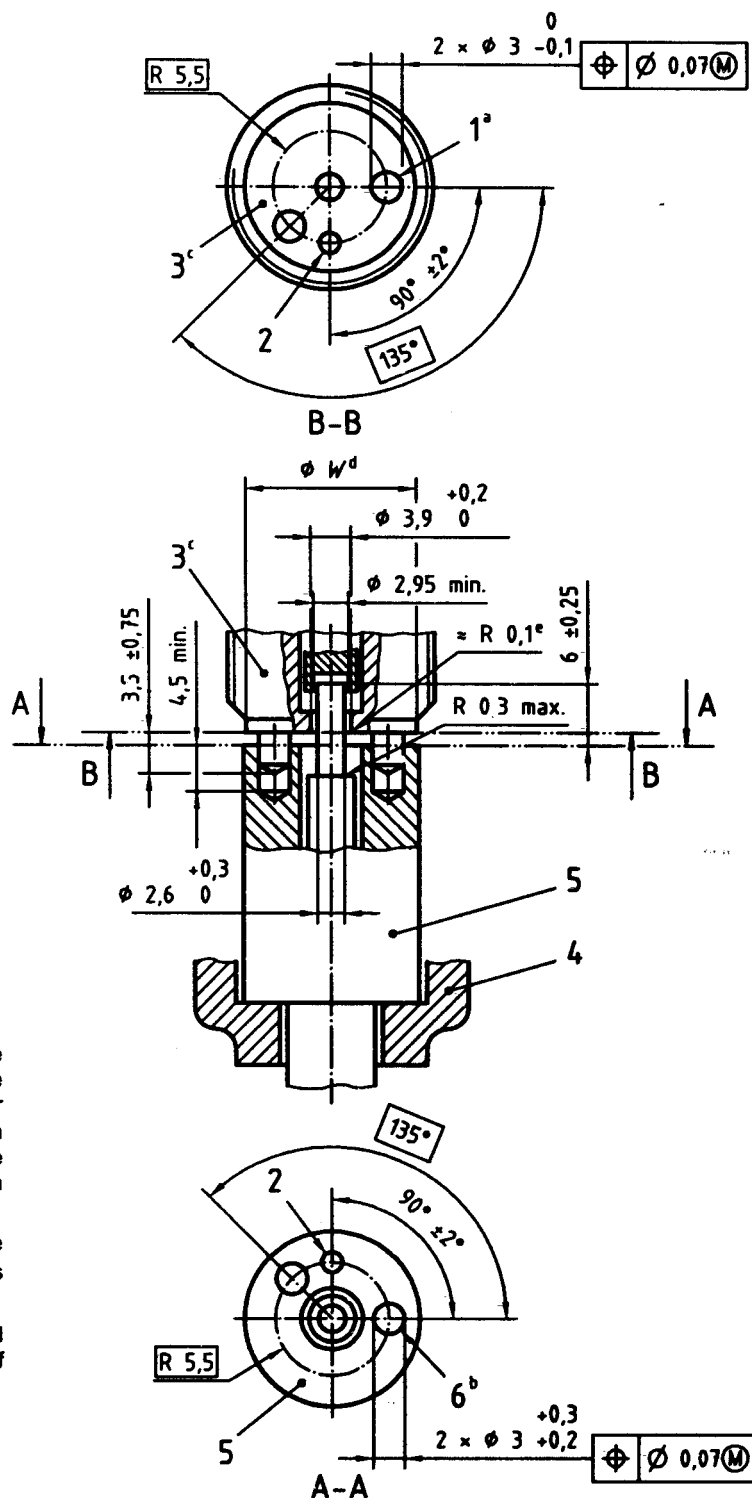
The assembly dimensions and tolerances given in Figure 4 apply to nozzle types A1, A2 and B and to nozzle holders of types 2 to 6 (ISO 2699), types 12 to 15 (ISO 7030) and types 20, 21, 21.1 and 27 (ISO 7026).

The dimensions of the nozzle holder dowels and the nozzle dowel holes, as well as the dimensions and tolerances for their position, are necessary only if requested by the customer.

5 Other dimensions and specifications

Dimensions and requirements not specified in this International Standard are left to the discretion of the manufacturer.

Dimensions in millimetres



Key

- 1 Reference dowl
- 2 Fuel feed hole position
- 3 Nozzle holder body
- 4 Nozzle cap nut
- 5 Nozzle
- 6 Reference dowl hole

- ^a The angular tolerance between the reference dowl and the locating device which fixes the position of the nozzle holder in the diesel engine is $\pm 1^\circ$. Depending on the design of the locating device, it may be necessary to consider the axis of a hole in a fixing flange, a fixing lug, or a fixing slot.
- ^b The angular tolerance between the reference dowl hole and the injection holes is $\pm 1^\circ 30'$.
- ^c The reference axis of the nozzle holder shall pass through the centre of the circle of diameter W .
- ^d Dimension W not specified.
- ^e Optional: equivalent chamfer.

Figure 4 — Assembly

Annex A
(normative)

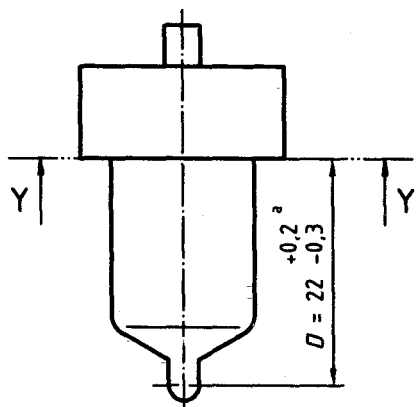
Hole type, short-stem nozzle — Type C

The hole type, short-stem nozzle, type C, conforms to the requirements for nozzle type B except for the dimension D shown in Figure A.1.

The cap nut used for fixing the type C nozzle shall be of the same type as that used for the type B nozzle (see 4.1).

Nozzle holders assembled with type C nozzles shall meet the requirements given in 4.2.

Dimensions in millimetres



^a This dimension determines the distance between the reference plan YY' and the point of intersection of the axes of the injection holes with the nozzle axis.

Figure A.1 — Hole type, short-stem nozzle — Type C

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Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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